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NEW OR LITTLE KNOWN NORTH AMERICAN TREES

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IN the tenth volume of *The Silva of North America*, which was published on November 30, 1896, descriptions and figures of two species of *Thrinax* from southern Florida were included, and an allusion was made to the existence of two other Florida species known only from fragmentary specimens. Since the appearance of that volume I have made three journeys to the keys of southern Florida for the special purpose of studying the plants of this group, and at last I have obtained sufficient material to throw some further light on their characters and distribution.

In the original description of the genus *Thrinax*, founded by Swartz on a West Indian tree, the fruit is described as baccate, the size of a small pea and slightly fleshy, with a single seed, white in the interior with a red middle ("nucleus solitarius, nauco osseo fragili tectus, intus albus, medio ruber"). Martius, in 1824, in his *Palmarum Familia ejusque Genera*, practically adopted Swartz's characters for the genus, describing the albumen as "solidum, æquabile," but Endlicher, who next described *Thrinax* in the *Genera Plantarum*, speaks of it as "æquabile aut subruminatum," showing, probably, his acquaintance with some plant unlike the type of Swartz's genus. Martius in the *Historia Palmarum* also calls the fruit baccate, Swartz's red interior of the seed being explained by the infolding of the testa which leaves

a deep basal cavity in the horny albumen. Martius, however, now enlarged the genus to include the *Thrinax argentea* of Roemer & Schultes, with seed marked by numerous vertical grooves caused by the regular infolding of the testa into the lobed albumen ("nucleus vasis impressis a basi sursum decurventibus insculptus"). Bentham & Hooker, who next described the genus, speak of the seed as vertically sulcate ("sulcis sinuatis verticalibus exculptum") without referring to the fact that in the type of the genus and in some of the species referred to it by Martius the seed is simply penetrated by a basal cavity. Drude in his study of the genus divided it into three sections, *Euthrinax* for the species with sulcate seeds and ruminant albumen; *Heminothrinax* for the younger Hooker's monotypic genus of that name with setulose perianth lobes, sessile extrorse anthers, and seeds penetrated by deep basal cavities; and *Porothrinax*, a name proposed (without characters) by Wendland in Grisebach's *Catalogus Plantarum Cubensium* for *Thrinax pumilio*, the type of a group of species with nearly sessile flowers, ovate acute perianth lobes, triangular filaments, and uniform albumen penetrated by a deep basal cavity—that is, with seeds similar in structure to those of Swartz's type of *Thrinax*. Baillon followed Drude in his treatment of the genus, and in the tenth volume of *The Silva of North America* this arrangement was also adopted. An examination of fresh material shows, however, that the fruit of the Florida species with uniform albumen penetrated by a basal cavity is drupaceous and ivory-white, and that in those species in which the seed is vertically sulcate by the infolding of the testa into the ruminant albumen the fruit is baccate and black. Principally for this reason, and for some less important characters, I propose to group the *Thrinax*-like plants of Florida in two genera as follows: ¹

¹ In all the *Thrinax*-like plants of Florida the pericarp remains thin and crustaceous until the seed is fully developed, and then quickly thickening becomes succulent and very juicy, a character which is not often apparent in the herbarium, as the fruit is frequently collected before the pericarp begins to thicken. Even when it is gathered fully ripe the flesh becomes thin and leathery in drying and gives a very imperfect idea of the fresh fruit.

THRINAX Swartz.

THRINAX Swartz, Prodr. 57. 1788; Fl. Ind. Occ. 1:614. *pl.* 13.—Martius, Palm. Fam. Gen. 8; Hist. Nat. Palm. 3:255 (in part).—Endlicher, Gen. 357 (in part).—Drude, in Engler & Prantl Pflanzenfam. II. 3:34 (§ *Porothrinx*).—Sargent, Silva, 10:49 (§ *Porothrinx*).

Flowers solitary, minute, articulate on slender elongated or stout abbreviated disk-like pedicels in the axils of ovate acute deciduous bracts. Perianth cupular, truncate at the base, six-lobed, the lobes obscure or broadly ovate and acute, persistent under the fruit. Stamens six (or nine),² inserted on the base of the perianth; filaments subulate, thick and scarcely united at the base, or nearly triangular and joined below into a cup adnate to the perianth; anthers oblong, two-celled, opening longitudinally, inserted on the back below the middle, introrse, becoming reflexed and extrorse at maturity. Ovary superior, ovoid, one-celled, gradually narrowed into a stout columnar style crowned by a broadly funnelform flat or oblique stigma; ovule solitary, basilar, erect, hemi-anatropous; micropyle lateral. Fruit drupaceous, one-seeded, globose, marked at the apex with the remnants of the style and bearing at the base the slightly thickened perianth of the flower; sarcocarp thin, green, crustaceous, ultimately much thickened, ivory-white, juicy, bitter and easily separable from the thin putamen of two closely adherent coats, the outer crustaceous, pale tawny-brown and slightly tuberculate, the inner membranaceous, silvery-white and lustrous. Seed free, erect, nearly globose, slightly flattened at the two ends, depressed at the base; hilum subbasilar, oblong, pale, conspicuous; raphe short, unbranched, obscure; testa thin, pale or dark chestnut brown and lustrous; albumen uniform, more or less deeply penetrated by a broad basal cavity; embryo lateral.

Unarmed trees with simple elongated or rarely short stems marked below with the ring-like scars of fallen leaf-stalks and

² In Swartz's *Thrinax parviflora*, the type of the genus, and in all the Florida species, there are six stamens, but in *Thrinax excelsa* Grisebach, of Jamaica, the number is said to be nine, although this fact does not appear in the recent description of the species in *The Botanical Magazine* (115: *pl.* 7088).

clothed above with the long persistent vaginas, and long tough wiry roots covered with thick orange-brown loosely attached rind. Leaves alternate, induplicate in vernation, orbicular or truncate at the base, thick and firm, usually silvery white on the lower surface, more or less divided into two-parted obliquely folded lobes with thickened margins and midribs; rachis reduced to a narrow border with a thin usually undulate reflexed margin; ligule thick, concave, pointed, often lined while young with hoary tomentum; petioles stout, elongated, flattened, slightly rounded above and below, their margins thin and smooth, concave toward the base and gradually enlarged into vaginas of coarse netted fibers covered with thick hoary tomentum. Spadix paniculate, interfoliar, pedunculate, as long as or longer than the petioles; its primary branches short, alternate, compressed, incurved, furnished with numerous slender terete alternate flower-bearing branchlets in the axils of ovate acute scarious deciduous bracts; spathes numerous, tubular, thick and firm, coriaceous, two-cleft and more or less tomentose toward the apex.

To *Thrinax*, in addition to the three Florida species, should be referred *Thrinax parviflora* Sw., *Thrinax excelsa* Griseb., *Thrinax Morrisii* H. Wendl., *Thrinax multiflora* Mart., and *Thrinax pumilio* R. & S.

PEDICELLATAE. Flowers long-pedicellate; perianth obscurely lobed or nearly truncate; filaments subulate, hardly united at the base, much exserted; stigma oblique.

***Thrinax Floridana*, n. sp.**

Thrinax parviflora Vasey, Rep. U. S. Dept. Agric. 1875: 186 (Cat. Forest Trees U. S. (not Swartz) 1876.—Chapman, BOT. GAZETTE 3: 12; Flora S. States, Suppl. [ed. 2] 651, [ed. 3] 462.—Sargent, Silva 10: 51 (in part), pl. 510 as to the leaf.

Flowers on slender pedicels nearly an eighth of an inch long, ivory-white, very fragrant with a pungent aromatic odor. Fruit from one quarter to three eighths of an inch in diameter, somewhat depressed above and below. Seed from an eighth to

nearly a quarter of an inch in diameter, dark chestnut-brown and lustrous, penetrated nearly to the apex by the broad basal cavity.

A tree with a slightly tapering stem from twenty to thirty feet in height and from four to six inches in diameter, covered with smooth pale blue-gray rind and generally clothed to the middle and occasionally to the ground with the persistent clasping bases of the leaf-stalks. Leaves nearly orbicular, or truncate at the base, rather longer than they are broad, yellow-green and lustrous on the upper surface, silvery-white on the lower surface, divided to below the middle into numerous lobes varying from an inch to an inch and a half in width near the middle of the leaf; ligule long-pointed, bright orange color, three quarters of an inch long and broad; petioles from four feet to four feet and a half in length, pale yellow-green, three quarters of an inch wide at the orange-colored more or less tomentose apex, much thickened and tomentose and from two inches to two inches and a half wide at the base. Spadix from three feet to three feet six inches in length, its primary branches from six to eight inches long, ivory-white when the flowers open like the slender secondary branches, but turning light yellow-green before the fruit ripens and orange-brown in drying. Flowers in June and sometimes also irregularly in October or November; fruit ripening six months later.

Dry coral ridges and sandy shores from Cape Romano to Cape Sable on the mainland and from Torch Key to Long Key. Discovered by Dr. A. W. Chapman on Cape Romano in the autumn of 1875, and on Cape Sable by Dr. A. P. Garber in October 1879. This is the *Thrinax excelsa* of Florida nurserymen but not of Grisebach. Closely related probably to *Thrinax parviflora* of Swartz, which appears to be widely distributed through the West Indies and to occur on the shore of Central America, but distinct from that species, as collected by Charles Wright in Cuba (no. 2329) and determined by H. Wendland, in its longer and stouter fruiting pedicels, smaller fruit and deeper seminal cavity, and pronounced unlike any of the species of

Thrinax in the Herbarium of the Royal Gardens at Kew, where, through the courtesy of the director, Mr. W. T. Thiselton Dyer, my Florida material has been compared.

Seeds of *Thrinax Floridana* were distributed from the Arnold Arboretum in December 1898, as *Thrinax species no. 2*.

SESSILIFLORÆ. Flowers short-pedicellate; perianth lobes broadly ovate, acute; filaments nearly triangular, united below into a cup adnate to the perianth; stigma flat.

***Thrinax Keyensis*, n. sp.**—Flowers on low disk-like pedicels, ivory-white, faintly aromatic. Fruit from one sixteenth to nearly one quarter of an inch in diameter, with thin flesh. Seed three sixteenths of an inch in diameter, pale chestnut-brown, penetrated only to the middle by the basal cavity.

A tree with an ashy-gray stem often twenty-five feet in height and from ten to fourteen inches in diameter, raised on a base of thick matted roots two or three feet high and eighteen or twenty inches wide. Leaves nearly orbicular or truncate at the base but rather longer than broad, from three to four feet in length, divided for two thirds of their length into lobes which are often two and a half inches wide near the middle of the leaf, the lowest lobes parallel with the petiole or spreading from it at right angles, thick and firm, light yellow-green and very lustrous on the upper surface, with bright orange-colored midribs and much thickened orange-colored margins to the lobes, on the lower surface at first coated with hoary deciduous tomentum and at maturity pale blue-green and more or less covered with loosely attached silvery-white pubescence; ligule thick, pointed, an inch long and wide, lined at first with hoary tomentum; petioles stout, flattened above, obscurely ridged on the lower surface, tomentose while young, pale blue-green, from three to four feet long, an inch wide at the apex, and from three to four inches wide at the much thickened concave base, coated like the broad vaginas of coarse tough fibers with felt-like tomentum. Spadix six feet long, stout, spreading, gracefully incurved, its primary branches much compressed, from three to four inches in

length at the base of the panicle to an inch and a half in length at the apex, bright orange colored like the short secondary branches. Flowers opening in June and occasionally also irregularly in November; the fruit ripening six months later.

Thrinax Keyensis inhabits the north shore of the largest of the Marquesas group of islands about fifteen miles west of Key West, where it was first seen by me in November 1886, but without flowers or fruit, and where there are several large groves; it grows also on Crab Key, a small island to the westward of Torch Key, one of the Bahia Honda group. It is this plant which I referred to EUTHRINAX (Garden and Forest 9: 162; Silva 10: 50), with the mistaken idea that the large black fruit which I had gathered on the Marquesas in 1886 had been produced by this tree. Seeds of *Thrinax Keyensis* were distributed from the Arnold Arboretum in December 1898 as *Thrinax* no. 3.

THRINAX MICROCARPA Sargent, Garden and Forest 9: 162. 1896; Silva 10: 53. *pl.* 511.

This tree, which is the commonest and most generally distributed species on the south Florida keys, is correctly figured in the tenth volume of *The Silva*, except the fruit, which, until recently, I supposed to have an orange-brown crustaceous pericarp. It differs from *Thrinax Keyensis* in its taller and more slender trunk without a basal enlargement, in its shorter spadix and smaller fruit with darker colored seeds, and in its smaller and thinner leaves. The structure of the flower and fruit is identical. This is the *Thrinax argentea* of Curtiss's distribution (no. 2679), but not of Loddiges, which belongs to another genus.

COCCOTHRINAX, n. gen. CORYPHEÆ.

Thrinax Endlicher, Gen. 253. 1836 (in part). Martius, Nat. Hist. Palm. 3: 254 (in part). Bentham & Hooker, Gen. 3: 930. Drude in Engler & Prantl Pflanzenfam. II. 3: 34 (§ EUTHRINAX). Baillon, Hist. Pl. 13: 317 (in part). Sargent, Silva 10: 49 (§ EUTHRINAX.)

Flowers perfect, solitary, minute, articulate on slender pedicels in the axils of ovate acute caducous bracts. Perianth cupu-

lar, truncate at the base, obscurely six-lobed, deciduous. Stamens nine, inserted on the base of the perianth, exserted; filaments subulate, barely united at the base; anthers oblong, attached on the back near the middle, introrse, two-celled, the cells opening longitudinally. Ovary superior, ovoid, one-celled, narrowed above into a slender columnar style crowned by the funnelform oblique stigma; ovule solitary, basilar, anatropous; micropyle subbasilar. Fruit baccate, subglobose, one-seeded, crowned with the remnants of the style, raised on the thickened torus of the flower; exocarp at first thin, of two closely united coats, the outer crustaceous, bright green, the inner membranaceous, silvery-white; in ripening becoming thick, sweet, juicy, homogeneous, black and lustrous, easily separable from the seed. Seed free, erect, depressed-globose; testa thick and hard, vertically sulcate with numerous narrow grooves running irregularly from the base of the seed toward its apex, deeply infolded into the ruminant albumen; hilum subbasilar, minute, obscure; raphe hidden in the folds of the testa; embryo lateral.

Trees with slender stems marked below by the ring-like scars of fallen leaf-stalks and clothed above with the long-persistent petiole-sheaths, or rarely stemless. Leaves terminal, induplicate in vernation, alternate, orbicular or truncate at the base, pale or silvery-white on the lower surface, thin and brittle, more or less deeply divided into narrow acute two-parted obliquely folded lobes; rachis short; ligule free, thin, erect, concave, rounded or long, pointed at the apex; petioles compressed, slightly rounded and ridged on the two surfaces, thin and smooth on the margins, gradually enlarged below into elongated vaginas of coarse fibers forming an open conspicuous net work generally clothed while young with thick hoary tomentum. Spadix interfoliar, paniculate, shorter than the petioles; its short primary branches incurved, furnished with numerous short flower-bearing secondary branchlets from the axils of scarious acute bracts; spathes numerous, papyraceous, two-cleft at the apex.

The generic name is in allusion to the berry-like fruit.

The following extra-Florida species previously referred to

Thrinax belong in *Coccothrinax*. *Thrinax argentea* R. & S.; *Thrinax radiata* R. & S. (*Thrinax gracilis*, *elegans* and *aurita* of gardens). Wright's no. 3966 from Cuba labeled *Thrinax acuminata* Griseb. & Wendl., apparently an unpublished name, also belongs to this genus.

***Coccothrinax jucunda*, n. sp.**

Thrinax parviflora Sargent, Forest Trees N. Am., Tenth Census U. S. 9:217. 1884 (not Swartz); Silva 10:51, in part pl. 510 (excl. figure of leaf).

Thrinax argentea Chapman, Flora S. St. [ed. 3] 462. 1897 (not Roemer & Schultes).

Flowers raised on rigid spreading pedicels an eighth of an inch long; perianth white; anthers light yellow; ovary orange color; stigma pale rose color. Fruit from one half to three quarters of an inch in diameter, bright green when fully grown, later becoming succulent, bright violet color, very lustrous and ultimately nearly black, the flesh sweet and edible. Seed light tawny-brown, from an eighth to a quarter of an inch in diameter. Flowers in June and also irregularly in November; fruit ripening six months later.

A tree with a stem slightly enlarged from the ground upward, from fifteen to twenty-five feet in height and from four to six inches in diameter, covered with pale blue-gray rind. Leaves nearly orbicular but rather longer than broad, thin and brittle, from eighteen to twenty-four inches in diameter, divided to below the middle or toward the base of the leaf nearly to the ligule into narrow lobes, an inch across in their widest part, with much thickened bright orange-colored midribs and margins, pale yellow-green and very lustrous on the upper surface, bright silvery-white on the lower surface: rachis thin, undulate, obtusely short-pointed, dark orange colored; ligule thin, concave, crescent shaped, often oblique, slightly undulate, occasionally obtusely short-pointed, three quarters of an inch wide, one third of an inch deep, light or dark orange color; petioles slender, flexible, soon becoming pendent, rounded on the upper side, obscurely ribbed on the lower side, with low rounded ribs, from two and a

half to three feet long, pale yellow-green, an inch and a half wide at the base, coated at first like the young leaves with silvery-white deciduous tomentum toward the orange colored apex. Spadix from eighteen to twenty-four inches in length with a flattened peduncle, slender, much flattened, primary branches from eight to ten inches long and light orange-colored like the slender terete secondary branches; spathes thin, fibrous, brittle, pale reddish-brown and coated toward the ends with pale pubescence.

Dry coral ridges from the shores of Bay Biscayne, where it is rare, along many of the southern keys to the Marquesas group, west of Key West. Discovered by A. H. Curtiss in 1880. Very similar to *Thrinax argentea* R. & S., the seeds differing, however, from those of that species as named in the herbarium of the Royal Gardens, Kew, in their brown, not mahogany-red, color and larger size.

Coccothrinax Garberi, nom. nov.

Thrinax Garberi Chapman, Bot. Gazette 3:12. 1878; Flora S. States Suppl. [ed. 2] 651. Sargent, Silva 10:50.

Thrinax argentea var. *Garberi* Chapman, Flora S. States [ed. 3] 462. 1897.

A stemless plant similar to the last in the structure of its flowers-and fruit and in the texture and color of the leaves, but smaller in all its parts, the leaves being only about ten or twelve inches in diameter. Found only on dry coral ridges near the shores of Bay Biscayne, and possibly only a depauperate form of the last.

Serenoa arborescens, n. sp.—Flowers minute, one twentieth of an inch long or less, perfect, sessile, in from one to three-flowered clusters in the axils of ovate acute chestnut-brown bracts, bibracteolate. Calyx truncate at the base, three-lobed, the lobes oblong, rounded and more or less laciniate on the margins, light chestnut-brown, thickened and persistent under the fruit. Corolla yellow-green, three-parted to the base, the divisions valvate in æstivation, oblong-ovate, thick, concave,

acute and much thickened at the apex, grooved on the inner surface with two or three deep depressions, deciduous. Stamens six, included; filaments nearly triangular, united below and adnate to the short tube of the corolla; anthers short-oblong, attached on the back below the middle, introrse, two-celled, the cells opening laterally. Ovary oblong-obovate, of three carpels free below, united above into a slender elongated style; stigma minute, terminal on the fruit; ovule solitary, erect from the bottom of the cell, anatropous. Fruit drupaceous, one-seeded, globose, one third of an inch in diameter, black and lustrous, usually bearing at the base the minute abortive carpels; exocarp thin and fleshy; mesocarp thin, fibrous, orange colored, strong-smelling, closely investing the pale brown crustaceous putamen. Seed free, subglobose, somewhat flattened below; testa hard, chestnut-brown and lustrous, lighter-colored on the ventral side with a large pale circular mark; hilum basal; raphe ventral, oblong, acute, unbranched; micropyle joined to the testa by a pale band; albumen homogenous; embryo lateral.

A tree thirty or forty feet in height with one or several stems three or four inches in diameter, clothed above for many years with the vaginas of the leaf stalks and covered below with smooth pale gray bark, and erect or often more or less inclining and occasionally semiprostrate. The leaves are terminal, semi-orbicular, truncate at the base, thin and firm, bright yellow-green on the upper surface, blue-green on the lower surface, two feet wide and long, divided nearly to the base into narrow linear-lanceolate lobes, their midribs and margins only slightly thickened and pale yellow; rachis acute, its narrow border free, thin and membranaceous; ligule thin, concave, short-pointed, furnished with a deciduous membranaceous red-brown border a quarter of an inch wide; petioles slender, flat on the upper surface, convex and stoutly ribbed on the lower surface, from eighteen to twenty-four inches long, one third of an inch wide at the apex, an inch wide at the base, armed with stout flattened orange-colored teeth; vaginas thin and firm, bright mahogany-red, very lustrous, closely infolding the stem, their fibers thin and brittle. The

spadix is interfoliar, from three to four feet long, its stem slender and flattened; branches slender, elongated, paniculate, gracefully drooping, coated with hoary tomentum, the ultimate divisions terete; bracts ovate, acute, chestnut-brown; spathes six or eight, sheathing the peduncle, thick and firm, deeply two-cleft at the apex furnished with a narrow membranaceous red-brown border.

Margins of swamps adjacent to the Chockoloskee river in southwestern Florida.

This second species of *Serenoa* differs from the type of the genus, the well-known saw palmetto of the southern states, in its arborescent habit, more elongated spadix, much smaller flowers, and smaller globose fruit and seeds, and is certainly a most interesting addition to the trees of the United States. The existence of an undescribed arborescent palm on the Chockoloskee river was known to me as long ago as 1887, when it was discovered without flowers and fruit in the Royal Palm Hummock, not far from the town of Everglade, by the late P. W. Reasoner, of Oneco, Florida; but it was not until the past season that I obtained the flowers and fruit from Mr. R. G. Corbitt, of Immockalee, Florida, who has found this palm growing abundantly in the swamps about thirty miles southeast of Lake Trafford, near the head of the Chockoloskee. In December 1898, seeds of *Serenoa arborescens* were distributed from the Arnold Arboretum as "New palm from the Florida everglades."

Ulmus (MICROPTOLEA) **serotina**, n. sp.—Arborescent. Leaves oblong to oblong-obovate, acuminate, variously oblique at the base, coarsely and doubly crenulate-serrate, membranaceous, glabrous and lustrous above, puberulous below on the prominent midribs and veins. Flowers perfect, autumnal, racemose, from buds in the axils of leaves of the year, long-pedicellate. Calyx six-parted to the base, its divisions oblong-obovate, rounded at the apex. Ovary sessile, narrowed below, hirsute. Samaras stipitate, oblong-elliptical, deeply two-parted at the apex, ciliate on the margins. Seeds obovate; raphe conspicuous. Young leaves, stipules and bracts unknown.

A tree with a trunk forty or fifty feet in height and from two to three feet in diameter covered with close pale gray bark, comparatively small spreading or pendulous branches, slender pendulous branchlets, light reddish-brown, lustrous and marked occasionally with white lenticels, growing darker during their second season, ultimately dark gray-brown and often furnished in their second or third year with two or three thick corky wings. The winter-buds are ovate, acute, a quarter of an inch in length and covered with numerous oblong-obovate dark chestnut-brown scales. The leaves are thin and firm in texture, yellow-green and lustrous on the upper surface, rather paler on the lower surface, from two to three inches in length, with prominent midribs and about twenty pairs of primary veins running to the points of the principal teeth and often forked near the margin of the leaf, obscure reticulate veinlets, and stout petioles a quarter of an inch in length; in the autumn they turn orange-yellow before falling. The flowers are reddish-brown with yellow anthers, and are borne on slender conspicuously jointed pedicels often an eighth of an inch long in many-flowered racemes from an inch to an inch and a half in length. The fruit, which ripens early in November, is about half an inch long and is fringed on the margins with long silvery-white hairs.

Banks of the French Broad river near Dandridge, Tennessee; limestone bluffs of the Cumberland river, near Nashville, Tennessee; limestone ridges near Huntsville, Alabama, and Rome, Georgia; occasionally planted as a shade tree in the streets of Huntsville and Rome, and when cultivated in good soil and with abundant space distinguished by its broad handsome head of pendulous branches.

Ulmus serotina was collected by Rugel on the French Broad river in October 1842³; it was found near Nashville, by Dr. A. Gattinger, as early, at least, as 1879, and, although he noticed its autumnal flowers, it was referred by him to *Ulmus racemosa*. It has been distributed without flowers or fruit as *Ulmus racemosa*.

³One of Rugel's specimens, with a few fragmentary flowers, is preserved in the herbarium of Columbia University.

from the Biltmore Herbarium (*no.* 3634 *b*) from collections made at Nashville in 1897; and on the 9th of October, 1898, a single large tree in fruit was seen by Mr. John Muir, Mr. William M. Canby, and myself close to the high road which leads eastward from Huntsville across the ridge known as Monte Sano. Subsequently it was found to be abundant on the hills near Huntsville and on those in the neighborhood of Rome by Mr. C. L. Boynton, of the Biltmore Herbarium. It is the *Ulmus racemosa* of Chapman's *Flora* (ed. 2, Supplement, 649; ed. 3, 444) so far as relates to the river banks of Tennessee, and the *Ulmus racemosa* of Sargent's *Silva* (7:48) so far as relates to middle Tennessee.

Ulmus serotina is an interesting addition to the small group of autumn-flowering elms in which the calyx is divided to below the middle (MICROPTOLEA of Spach), and to which belong *Ulmus crassifolia* Nutt. of southern Arkansas and Texas, and *Ulmus parvifolia* Jacq. of northern and central China. From these it differs in its racemose flowers, more deeply divided calyx with obovate lobes, and in its much larger and acuminate leaves. The Himalayan *Ulmus lancifolia* Roxb. (*Ulmus Hookeriana* Planchon), also with a deeply divided calyx, is placed by Planchon (De Candolle, Prodr. 17:162) in MICROPTOLEA, but the flowers, which are borne in short racemes, appear in spring from the axils of leaves of a previous year.

ARNOLD ARBORETUM.